Chapter 5

Meeting the Needs of the Vulnerable Learner

The Role of the Teacher in Bridging the Gap Between Informal and Formal Learning Using Digital Technologies

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"I never try to teach my students anything. I only try to create an environment in which they can learn." (Einstein, as quoted in Prensky, 2001a, p. 71)

This chapter explores the role of learner self-identity in relation to formal and informal learning. It also examines the part digital technologies play in both these contexts. In particular I highlight how difficult it is for both students and their teachers to break free of the notion that the only "real learning" and knowledge is to be found in "formal learning," defined as the information transmitted in lecture fashion by the teacher and found in textbooks and approved by teachers in the form of assignments, grades, and assessments. By contrast, "informal learning" can be defined as "any activity involving the pursuit of understanding, knowledge, or skill which occurs outside the curricula of educational institutions, or the courses or workshops offered by educational or social agencies" (Livingstone, 2001, p. 51).

One does not have to be a disciple of Foucault to understand the importance of the wall between institutionally sanctioned learning and what exists beyond it. Clearly informal learning is perceived by most teachers and students as standing at some distance from its formal counterparts. It is not too much of an exaggeration to conclude that informal learning is just not seen as part of the "school's business"—and so, not surprisingly, it is widely ignored. Neither the progressive era of education nor its modern renaissance in the 1960s could do much to scale that barrier, as informal learning continues to be defined in opposition to school, whether it is incidental (finding out something by accident), socialized (learning without knowing you are, as with table manners or language), or intentional (pick-

ing up a book). Informal learning, particularly the socialized kind that leads to most children's ability to master grammar of any language by the age of 4 without formal instruction, has a more powerful reach than formal learning. Yet its potential is seldom tapped by schools which continue to regard "real learning" as the transactions carried on in the classroom and controlled by the teacher. For example, few honors are available to children who have not just learned computer functions and applications but also how to repair and service them, or who can play advanced videogames. Rather these children may be identified as "techies" or at worst "nerds" or "geeks."

The power of digital technologies is that they lend themselves to informal learning and as such pose a challenge to the conventional orthodoxy that formal learning is the only real and valid kind that can be accepted in schools. One of the better explanations for why this state of affairs continues to exist has been offered by David Tyack and Larry Cuban (1995). They coined the phrase "the grammar of schooling" to explain the way various concepts such as the "lesson period," and the notion of a curriculum that needs to be "covered" and assessed within certain defined parameters, got started some time in the nineteenth century and became considered as the normal way schools, teachers, and students operated. Given this context it is not surprising that, for example, students' obvious interest in videogames should be sidelined by schools even when some educational aspects of certain games have been well described.[1] A leading advocate for a more game-driven curriculum, Marc Prensky (2005a), is engaged in an uphill battle to convince his colleagues as to their value. Commenting on how bestselling games deliver on their promises of exciting children's imagination, a place where students can continuously reinvent themselves, he contrasts that with the realities in classrooms:

> Rather than being empowered to choose what they want ("Two hundred channels! Products made just for you!") and to see what interests them ("Log on! The entire world is at your fingertips!") and to create their own personalized identity ("Download your own ring tone! Fill your iPod with precisely the music you want!")—as they are in the rest of their lives—in school, they must eat what they are served. (Prenksy, 2005a, p. 64)

Increasingly this type of control over technology—and the ways that students use it to learn informally—creates tensions, particularly in the high school setting. Prensky argues passionately that students want engagement—the same level they gain from computer games in their learning:

> In my view, it's not "relevance" that's lacking for this generation, it's engagement. What's the relevance of Pokémon, or Yu-Gi-Oh!, or American Idol? The kids will master systems ten times more complex than algebra, understand

systems ten times more complex than the simple economics we require of them, and read far above their grade level—when the goals are worth it to them. (Prenksy, 2005a, p. 64)

Notwithstanding many prestigious reports that would seem to underscore Prensky's belief that the high school experience in particular is a source of profound boredom for many teenagers (e.g., Bridgeland, Dilulio, & Morison, 2006), there appear to be few takers for Prensky's challenge and no major software manufacturer out there willing to jump into the school market to produce an educational game on the same kind of scale as say, for example, *Grand Theft Auto*. It is still the student who must conform to the demands of formal education, not the other way around. The learning styles and strategies developed as a result of being part of the digital generation often have to be sacrificed to the requirements of reading textbooks, listening to lectures, and raising hands when the teacher asks for a response.

It is therefore not a big surprise to find a close link between higher numbers of bored and disengaged youngsters, poor grades, and increased dropout rates (Bridgeland et al., 2006). The resulting loss of talent is staggering. Despite the lip service that is paid to such nostrums that "children are our future," a "mind is a terrible thing to waste," and a widespread appreciation that everyone (following Howard Gardner's 1983 popular book) uses one of a number of distinct "learning styles," most of which are not deployed in schools—the educational system casts off 16-year-olds in their thousands and pays no real penalty for forsaking them—arguably it gains the advantage of higher per capita test scores and smaller class sizes. On the student end, the price to be paid in terms of a long term feeling of failure is enormous since the stigma of failure continues to haunt the student throughout their lifetimes even if they decide, as they rarely do, to return to school or take adult education courses. Their personalities and identities, shaped in so many ways by the new technologies, are not given much room to develop within the more confining environment of formal learning, and they tend to give up and perceive themselves as "failed learners." Bandura (1993) has traced how a cyclical process is begun when students constantly fail to reach teacher expectations. He argues that the resulting frustration lowers self-efficacy and makes students more likely to give up (Bandura, 1993).

The argument advanced here centers on our need to do more for the youth that disengage early and asks us to examine the opportunities that digital technologies present to re-engage a generation of informal learners who cannot find satisfactory ways to apply their skills in the formal learning context. The argument, therefore, has three prongs. First, informal learning is a place where most students can succeed. Rather than dismissing this

insight as too common an outcome to take seriously, we should be doing more to draw these students into the formal curriculum by recognizing how informal learning can build confidence as well as knowledge vital to success for all students who wish to develop skills and interests over a lifetime. Second, schools dismiss a need for students to perceive themselves as confident independent learners at their own peril—since research suggests that self-efficacy and confidence are critical elements if students are to grow into strong independent learners (Graham & Weiner, 1996). Third, for the group that can most benefit from informal learning, disadvantaged students (whom I shall, for reasons set out below, also call "vulnerable learners"), more effort to find spaces within the curriculum is necessary in order for them to develop success as informal learners. Teachers in such environments need to find ways to connect disadvantaged students' informal understandings with the formal curriculum.

The reason for the term *vulnerable learner* is to see those most at risk of academic failure as students who in their own eyes have already failed. There is no need at this time to dwell on the well-documented linkage between self-perception and failure, beginning with the famous Pygmalion study and in more recent years revealing itself in self-sabotaging tendencies of minorities who are not supposed to do well on tests like the SAT (e.g., Rosenthal & Jacobson, 1968). Suffice to say that this research strand is repeatedly overlooked or ignored in our willingness to keep sorting and labeling students despite the negative ramifications. The apparent consensus that early educational experiences determine later ones—as in the aphorism "if at first you don't succeed, you don't succeed" (Tuckett, 1997)—may be something of an overgeneralization, but not by much (Gorard, Rees, Fevre, & Welland, 2001). For example, many working-class students have what Selwyn, Gorard, and Williams(2001) refer to as a "deep reluctance" to continue their formal education because of the widely held perception that it is unrelated to the "real world" of making a living. They tend to perceive the academic world as not representative of their lives and realities.

The most common reasons for the vulnerable learner's proximity to failure is an early loss of self-confidence, an internalized feeling that they are "stupid" for not being able to do math or read at an early age (Chapman & Tunmer, 2003). This then clouds their appetite for taking on much extra effort if they find a subject or topic difficult—after all, they are stupid—so why could they be expected to understand x or y—goes the logic. It is not that more secure formal learners develop quite sophisticated strategies to solve unfamiliar problems, although sometimes they do. In many cases, they just know they can learn and have the confidence it takes to ask for help from teachers, from parents, peers, and in some cases tutors (Loranger, 1994). To change that unproductive dynamic means changing

fundamentally their orientation to knowledge. We need to place vulnerable learners in more situations where they do not see themselves as exercising any "smartness" or being judged and revealing again they are stupid. In other words, we need to place them in settings where they retain control over their own learning, a place where they can shed their old identity as the not-so-smart student and forget who they are supposed to be as they enjoy the natural process of learning they knew before they entered school, the activity known as play. In the sections that follow, I describe a fascinating illustration of how learning becomes play and vice versa with a description of a unique experiment involving computer learning in an Indian village. I then try to uncover some of the critical features that make such informal learning successful and then conclude with how those elements might be applied in conventional classrooms, with the additional support of some technology-based interventions as an enabler of some more effective strategies that can be used by vulnerable learners.

National statistics suggest that a large number of those vulnerable students are in fact minorities who in many urban areas now have a one in two chance of graduating high school (Vail, 2004). The question is, can we find a way forward? The path to success is not, I would argue, employing more failed traditional instructional methods most clearly typified by the all-purpose phrase "drill and practice," but to start from a recognition that today's average college graduates have spent over 10,000 hours playing videogames and only 5,000 hours reading (not to mention 20,000 hours watching TV) (Prensky, 2001b). Not addressing the needs of "digital natives" (to use Marc Prensky's phrase) is to risk further failure and loss of hope.

Informal Learning: Informal Play: A Case Study of Informal Learning in an Indian Village

Imagine a dusty and remote Indian village. Against one wall sits a computer kiosk crowded with children (see Figure 5.1)—all scrambling for a turn on the computer as if it were a videogame—some voices are shouting out advice to the lucky few at the front of the line, others are yelling for their turn. Soon it is clear the children are teaching each other how to control and operate the computer to find out information, play games, and generally impress each other with their skills. The excitement of finding how spontaneously children learn basic computer skills has been turned into a 2002 *Frontline* documentary. The person behind the idea, Indian Institute Chief Scientist, Sugatra Mitra, has always been fascinated with the use of technology to assist children learning. He tells his story to the *Frontline*
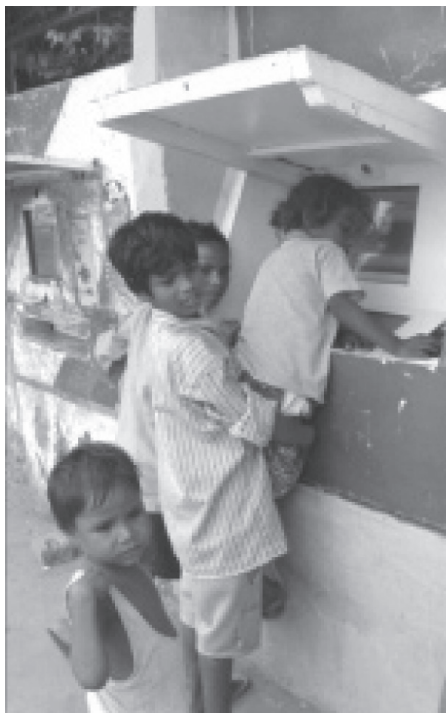
Figure 5.1. From the Hole in the Wall Education Ltd. http://www.hole-in-the-wall. com/ensuring-impact.html.

documentary team this way: "In 1988, I had written a very short paper to say that maybe children are capable of learning a whole bunch of things on their own, and specifically, perhaps computers. I got taken with my idea. But nobody else did." Eleven years later he found an opportunity to implement the idea when his company was exploring how to use kiosks to provide customers with new web based services.

> The idea had nothing to do with children. It was because kiosks were expected to become big business. Since I was heading R&D, I got the job to see how to build a kiosk. It was then a natural move to see what would happen if we built a kiosk in a village square, and the rest they say is history. (From Rory O'Connor, producer of the *Frontline*/World segment "The Hole in the Wall," October, 2002, http://www.pbs.org/frontlineworld/stories/india/connection. html; see Figure 5.2).

Mitra now refers to his experiment as "Minimally Invasive Education," as compared to traditional classroom learning. Mitra describes it as

Figure 5.2. From http://www.pbs.org/frontlineworld/stories/india/connection. html.

Note: Other photos can be obtained at http://www.niit.com/niit/ContentAdmin/images/ sugata/gallery3/index.htm and Dr Mitra: http://www.niit.com/niit/ContentAdmin/images/ sugata/gallery1/index.htm).

an alternative form of education. It's kind of primitive in the sense that if we were in a pack and three of us knew how to hunt then the rest of us need to know how to cook—you know something like that—whereas the formal education system says everyone needs to be an average hunter and an average cook. (King, 2004, p. 3)

He acknowledges it is difficult to integrate any of these approaches inside the formal curriculum He points out, for example, that while individual students may pick up things it is not true to say that the group learns everything in the same way:

. . . unlike the formal education system where you have an average achievement and fairly small deviation. Everybody in class knows approximately the same things. In the kiosks there is a remarkable growth in the average knowledge but there is also a very large standard deviation, which means that some children are learning something completely different from others. (King, 2004, p. 3)

The "Hole in the Wall" experiment is such a startling one partly because it runs so counter to the traditional way we understand education as a process of sitting down passively at a desk and either listening to a teacher

or reading a book. There are no rules here, only options: to engage in an unstructured open-ended activity where no one can predict what will happen with any certainty—or not. Disengagement is much harder than engagement given the pressure of the peer group, at turns pushing you forward to understand and to integrate, and then at others forcing you to the front as the group begins to decide on what to do with the new almost magical machine.

Reasons Why Formal Learning Does not Work for Vulnerable Learners

How do we translate any of the insights to be derived from the "Hole in the Wall" experiment to modern classrooms? We must begin by understanding why in too many instances formal learning—in other words traditional teaching methods—fail to connect with vulnerable learners. A good example of vulnerable learners these days are adolescent, particularly minority, boys who lag in reading. In their book *"Reading Don't Fix No Chevys,"* Smith and Wilhelm (2002) explore some reasons for boy's lack of prowess in reading as opposed to subjects like math and science. Through some expertly conducted case studies, the authors suggest that teachers are conducting a monologue, excluding boys and their emerging need to declare who they are as people by following a course of study in which they have no real interest and which has little relevance to their lives. This might be considered by most educators as tough luck—that is the way it has been through the ages; kids don't get choices in what they want to study. The point here is that schools often do not make a real effort to connect students' experiences with the formal curriculum—not even when the choice of curriculum content is not written in stone. The authors make a compelling case for teachers not to see themselves as teachers of content but to help "students independently engage with content" (p. 113). Such "content" might take a variety of forms—for example, Bam, an African-American 11th grader featured in *"Reading Don't Fix No Chevys"* feels that his real self—as expressed in poetry, rap, emails, and personal Internet searching—is completely disconnected from the one he presents in school. "You feel you can say anything you want to" on the computer, but like another student, Robert (a 10th-grade African-American), he rejected much of school writing—which he perceived to be more about correctness than expression. Robert viewed reading in English as being "too superficial, as jumping from topic to topic, as being about texts instead of ideas, and not being useful" (p. 202).

Smith and Wilhelm (2002) refer back to an entire tradition of writings that link identity with choice and control, starting with the great philosopher

Alfred North Whitehead. Whitehead believed that knowledge begins with interest—what the philosopher referred to as "romance." Cultivating student interests, according to Whitehead (1961), is the necessary first step toward assisting them to be knowledgeable. For the boys interviewed in *"Reading Don't Fix No Chevys,"* the computer represents a gateway to follow and develop their interests in a way school rarely made possible. When students feel they are in control of their own learning there is deeper engagement and, as Greene (1988) points out, an opportunity to deepen self identity.

Reaching Vulnerable Learners Without Disrupting the "Grammar of Schooling"

The conflict between the grammar of schooling (to use once again Tyack and Cuban's useful phrase, 2005) and the need for vulnerable learners to regain a measure of control over their learning environment has made it inevitable that many vulnerable students disengage from school. Running parallel to this trend is the way technology (particularly the Internet) has not been made widely available as a resource, resulting in growing frustration among students. In many schools, much of students' engagement with the Internet happens "outside of schools and outside of teacher direction" (Levin, Arefeh, Lenhart, & Rainie, 2002, p. 23). What are some productive ways we might use some of the strengths of informal learning while still living within the grammar of schooling?

Let me suggest three possible applications of technology in the school context that would emphasize informal learning:

1 Designing educational games that really are as good as the best video-games—speed, challenge and individual problem solving and control.
2 Creating more spaces outside of the school curriculum where students can engage in more informal learning such as "computer clubhouse"-type operations.
3 Developing more collaborative activities using technology that enable students to work together in groups and collaborate with teachers and interested adults.

Educational Games

Educational games offer an extremely promising way to bridge formal and informal learning, but so far the promise has not met the reality. There are very few games that have been developed that can come near the quality

of the best videogames. Advocates for educational videogames argue that the current use of technology in schools "has had little to do with transformation and far more to do with its principal appeal to educational administrators: its unprecedented capabilities for surveillance, control, and documentation—all basically forms of record-keeping—and so of 'educational *accountability*'" (DeCastell & Jenson 2003, p. 48). The same authors recommend a "digital re-tooling of curriculum by asking . . . how we can devise educative engagements which immerse students in the least pedantic, the most demanding, and the most engaging forms of intelligent participation in fields and forms of human endeavor?" (p. 52). It is a utopian-sounding challenge and we still seem a distance away from achieving anything close to this goal.[3]

There is of course some danger that we could be looking for a solution in the wrong place. If we burden the educational game with having to "teach" a certain set of academically valued content and skills we may well be destroying the potential of the game to be attractive to the user. Clearly, the game has to be less about solving teacher's dilemmas and more about addressing learners' need for some kind of role-playing experience. What may be needed is less the perfect "killer app game"—the one that teaches a year of physics in a two-hour game—and more one that enables teacher and student to discuss what the student has experienced in the game and use that conversation to recognize the skills and knowledge that the student gained as a result of the game. The agenda here is building learner confidence and enabling a student to be more in control of the conversation as a result of that experience than he or she would otherwise be. Because games are played in groups the peer group can play a more active role and have improved interaction with the teacher.

Computer Clubhouse

Another way to reach vulnerable learners is of course in the out-of-school hours, and a leading digitally based approach here is the Computer Clubhouse, which was started in 1993 by the Computer Museum in Boston in collaboration with MIT. There are now over 100 Computer Clubhouses worldwide. The goal of the Computer Clubhouse is to provide youth with access to resources, skills, and experiences that can help them succeed (see their website at http://www.computerclubhouse.org/). The basic idea is that students play the building bricks such as Lego to build robots and other gadgets, learning what they need to know through peer group interaction as well as through adult mentors. Mitchell Resnick of MIT and colleagues (a founder and leading advocate for the Computer Clubhouse concept)

write that students, particularly the disadvantaged, need to have an environment in which all their creative interests are supported as they rarely are in schools (Resnick, Rusk, & Cooke, 1998).

This approach works only if the environment supports a great diversity of possible projects and paths. Perhaps the most respected figure in this tradition is the late John Holt, who argued that for children to successfully learn they need to see adults work on their projects and act as mentors as they once did in an age before mass schooling. As Holt wrote (1977, p. 5.): "I'm not going to take up painting in the hope that, seeing me, children will get interested in painting. Let people who already like to paint, paint where children can see them." Collaboration takes on a whole new dimension in this type of environment—instead of students being placed into groups and told to collaborate, Resnick argues that communities "emerge" over time. Design teams form informally, coalescing around common interests. Communities are dynamic and flexible, evolving to meet the needs of the project and the interests of the participants. A large green table in the middle of the Clubhouse acts as a type of village common, where people come together to share ideas, visions, information, and even food. Resnick and his team seem not to be interested in connecting these concepts to formal learning, preferring instead to think about schooling in an entirely different light so the classroom resembles more the clubhouse than the other way around.

While institutionally it may be important for Computer Clubhouses to be viewed as separate from schools, there is no reason why a computer clubhouse concept cannot be built into schools. Places where students, particularly vulnerable students, can go to engage in some serious play—build a robot or construct a car that can traverse rocky terrain, etc.—could be a place where immature or wounded self-identifies can be nurtured once the vulnerable learner gains some feelings of self-respect and regard from an adult who respects him or her as a successful learner. The point here is that time is used not to cram more facts and drill more skills but to develop confidence and play—and an opportunity to take on a challenge and be successful completing the task.

Conclusion

Given the need for more practical advice following the large numbers of students for whom formal education fails with increasingly dire consequences for the individuals involved and for our society in general, it would seem that the movement towards advocating the introduction of more informal approaches to learning should be stronger. Alas it is not— we do not have in the US or Europe the counterpart to the folk high school

tradition that emerged first in Norway in the latter part of the nineteenth century and quickly spread through the rest of Scandinavia. In the Norwegian folk high school, attendance is voluntary, tuition is free and there are no tests or admission requirements. Currently there are 82 such schools in Norway that operate in a 33-week year from August through to May. As Harrington, Kopp, and Schimmel (2003) point out, "The pedagogical emphasis is on self-development through peer interaction, open discussion and dialogue" (p. 124). Each school has defined a different mix of subject areas from art and radio journalism to organic agriculture, childcare, and travel and tourism. "Folk high school teachers are selected not only for their competence in specific subject areas but their ability to instill, through example, the love for learning, community responsibility and individual growth hands-on experience" (p. 125). For many vulnerable students some time working in these areas in an environment that encourages confidence building and personal development is clearly something that is needed. It is an unfortunate consequence of the dominant accountability movement that it is harder to imagine any such system of youth development from taking root in the US—as indeed in most of the developed countries. We must continue to work with what we have— a promising range of technologies that whether the school likes it or not will force teachers to recognize student's capabilities to create worthwhile content and engage in new ways with media and subject matter. We can refer here to the growth of podcasting and the rapid way that teachers are finding ways to modify their own classrooms to accommodate not just the ubiquitous iPod but also a host of other micro technologies, from the Palm Pilot to smaller digital video cameras. The important first step is to realize that media saturated environments don't spell doom for student creativity. They can enable students to become more inspired if the teacher is to transfer more control to the student and harness the enthusiasm for the media and the desire to play more adult roles to advance curriculum goals.

Learner self-identity is a fragile thing—once lost it is very difficult to regain. Teachers bear a great deal of responsibility, particularly in the early grades, for shaping that identity and getting the child ready for lifelong learning—not just giving a grade on a test.

As Frank Smith (1998) reminds us,

> It is a frightening thought for many teachers that their students are learning all the time. Without any forgetting. And the students can't help it. They even learn things they might be better off not learning. The problem in school is not that many students aren't learning, but what they are learning. They may not learn what their teachers teach them, but their teachers may not be teaching them what they think they are teaching. To find out what students

actually learn, look at the way they leave school. If they leave thinking that "school things"—such as reading, writing, mathematics, or history—are boring, difficult and irrelevant to their lives and that they are "dummies" this is something they have learned both in school and outside. They learn to be non readers, or that they are nonspellers, or that they can't do mathematics. They learn who they are. If they learn they are leaders or geniuses (or clowns or fools) they behave accordingly. (p. 10)

The key to success in teaching is in being able to connect abstract thought with concrete experience, to represent new knowledge and new information (and practices and skills) in a way that connects with the student's accumulated body of experience. Informal learning can help bridge that often yawning divide that too frequently schools refuse to acknowledge is there. Smith (1998) reminds us about the need to start afresh. When Bruner (1966) observes the complex interaction among a certain tribe in Africa, we can perhaps see the kind of direction we have to go in. Among the Kung people of Africa, Bruner describes a different form of education from the way we often define "instruction":

> Among hunting-gathering humans there is constant interaction between adult and child, adult and adolescent, adolescent and child. Kung adults and children play and dance together, sit together, participate in minor hunting together join in song and story telling together . . . one virtually never sees an instance of "teaching" taking place outside of the place where the behavior to be learned is relevant. (pp. 150–151)

For better and worse we can—and have to—do it differently. Digital technologies may provide us another opportunity to start over.

Notes

1 Shreve (2005) suggests that games are viewed by their developers as "a supplement, not a replacement, for good, old-fashioned teaching" and quotes a game publisher as saying that "We see this not as the only way to teach history but as part of the whole process that will include lecture, textbook reading, and paper writing. But it will greatly enrich the process of doing all those things" (p. 31).

2 From http://www.pbs.org/frontlineworld/stories/india/thestory.html. For a copy of the video, see http://www.globalvision.org/program/how/how.html. For more information on the "Hole in the Wall" experiment, see Hole in the Wall Education Ltd.'s website at http://www.hole-in-the-wall.com/index.html.

3 Harvard University's Chris Dede's own project using NSF funding involves the design and study of "a multi-user virtual environment (MUVE) that uses digitized museum resources to enhance middle school students' motivation and learning of higher order scientific inquiry skills, as well as standards-based knowledge

in biology and ecology." http://muve.gse.harvard.edu/muvees2003/documents/Dede_Games_Symposium_AERA_2005.pdf (Retrieved, August 30, 2006).

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